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Gated Vertical Punch Through Device Used as a High Performance Charge Detection Amplifier

Field of the Invention

The present invention relates to solid-state image sensors, and more particularly to charge detection amplifiers of image sensors that employ a vertical punch through transistor for sensing charge.

Priority

Priority is Claimed from Provisional application SN 60/245,942, filed November 6, 2000.

Background of the invention

A typical image sensor senses light by converting impinging photons into electrons that are integrated (collected) in the sensor pixels. After the integration cycle is completed, charge is converted into a voltage that is supplied to the output terminals of the sensor. The charge to voltage conversion is accomplished either directly in the sensor pixels, such as in the Active Pixel CMOS image sensors, or remotely off the sensing area, in charge conversion amplifiers. The key element of every charge conversion amplifier is the charge detection node. As charge is transferred